

# Unit Planning Guide: Grade 6 Unit 1 of 8

<b>Unit Title:</b> Operations on Rational Numbers	<b>Pacing (Duration of Unit):</b> 5 weeks
<b>Grade:</b> 6	<b>Buffer Day(s):</b>

## Desired Results

### Transfer Goals (Priority practice standards in **bold**)

*Students will be able to independently use their learning to:*

- MP.1. **Make sense of problems and persevere in solving them.**
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. **Model with mathematics.**
- MP.5. Use appropriate tools strategically.
- MP.6. **Attend to precision.**
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

### Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

#### Prerequisite Standards:

- **Reading and writing decimals to the thousandths using base ten numerals, number names and expanded form. (Remembering, Applying)**
- **Comparing two decimals to thousandths using  $>$ ,  $=$ , and  $<$  symbols to record the results of comparisons. (Understanding, Applying)**
- **5.NBT.4 Rounding decimals to any place. (Applying)**
- 5.NBT.2 Explaining patterns when multiplying and dividing by powers of 10 (Understanding)
- **5.NBT.2** Using whole-number exponents to denote powers of 10. (Applying)
- Recognizing place value relationships. (Analyzing)

#### WIDA for English Language Learners

Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting

Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**  
In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports.

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### Standards (Priority Standards in **bold**):

- **6.NS.2:** Fluently divide multi-digit numbers using the standard algorithm.
- **6.NS.3:** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- **6.NS.1:** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
- **6.NS.4:** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express  $36 + 8$  as  $4(9 + 2)$ .*
- **6.NS.MA.4a:** Apply number theory concepts, including prime factorization and relatively prime numbers, to the solution of problems

### Meaning (\*Mostly assessed through Performance Tasks/Assessments)

#### Big Ideas:

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers, decimals, and find common factors and multiples.
- The meanings of each operation on fractions are consistent with the meanings of operations on whole numbers.
- When we divide one number by another, we may get a quotient that is bigger than the original number, smaller than the original number or equal to the original number.

**Essential Questions:** (Questions which frame ongoing and important inquiries about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)

- What would our society be like without decimals?
- How are fractions useful?

### Acquisition (\*Mostly assessed through traditional summative assessments)

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**Knowledge:** Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.

*Students will know ...*

- The standard algorithm for multiplying and dividing whole numbers
- The standard algorithm for adding, subtracting, multiplying and dividing multi-digit decimals
- That fractions can be represented in multiple ways visually

**Key Academic Vocabulary:**

- Algorithm
- Reciprocal
- Greatest Common Factor
- Least Common Multiple

**Knowledge Questions:**

- When I divide a fraction by a fraction what do the dividend, quotient and divisor represent?
- What kind of models can I use to show solutions to word problems involving fractions?
- How do mathematical operations relate to each other?
- How do I know which operation to use (+, -, x, ÷)?
- Why does the process of invert and multiply work when dividing fractions?
- When or why would it be helpful to know the least common multiple or greatest common factor of a set of numbers?

**Skills:** The discrete skills and process students should be able to use independently.

*Students will be skilled at:*

- Dividing multi-digit numbers using the standing algorithm. (knowledge)
- Fluently adding, subtracting, multiplying and dividing multi-digit decimals using the standard algorithms. (knowledge)
- Computing quotients of fractions (knowledge)
- Dividing fractions by fractions using visual models equations. (knowledge)
- Computing the greatest common factor within 100. (knowledge)
- Computing the least common multiple of two or more numbers less than or equal to 12. (knowledge)
- Applying the distributive property to solve problems. (applying)
- Applying prime factorization to solve problems. (applying)

**Resource Suggestions:**